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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/588,181

11/18/2008

Manfred Vogel

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EXAMINER

NGUYEN, DINH Q

ART UNIT

PAPER NUMBER

3752

MAIL DATE

DELIVERY MODE

11/15/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/588,181	Applicant(s) VOGEL ET AL.	
	Examiner Dinh Q. Nguyen	Art Unit 3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>8/01/06 & 4/14/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Species I in the reply filed on September 29, 2010 is acknowledged. The traversal is on the ground(s) that the Office Action fails to establish lack of unity of invention. This is found persuasive thus the Examiner is hereby withdrawn the Requirement for Restriction/Election dated August 31, 2010.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 13-22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Hiraki et al.

Hiraki et al. discloses a fuel-injection system for direct injection of fuel into a combustion chamber through a combustion-chamber top located opposite from a piston, comprising: a fuel injector 1 having a plurality of spray-discharge orifices A/B discharging a corresponding plurality of fuel jets, wherein the plurality of fuel jets form a spray cloud in the combustion chamber; wherein a first opening angle of the spray cloud along a first cross-sectional plane bisecting the longitudinal axis of the fuel injector is greater than a second opening angle of the spray cloud along a second cross-sectional plane bisecting the longitudinal axis of the fuel injector, the second cross-sectional plane extending perpendicular to the first cross-sectional plane; wherein the spray cloud is formed in the combustion chamber with a clearance angle between the combustion-chamber top and the spray cloud,

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and wherein the clearance angle is uniform along the circumference of the spray cloud (see figures 7 and 9).

4. Claims 13-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Bailey.

Bailey discloses a fuel-injection system 10 for direct injection of fuel into a combustion chamber through a combustion-chamber top located opposite from a piston, comprising: a fuel injector 22 having a plurality of spray-discharge orifices 62/98 discharging a corresponding plurality of fuel jets, wherein the plurality of fuel jets form a spray cloud in the combustion chamber; wherein a first opening angle of the spray cloud along a first cross-sectional plane bisecting the longitudinal axis of the fuel injector is greater than a second opening angle of the spray cloud along a second cross-sectional plane bisecting the longitudinal axis of the fuel injector, the second cross-sectional plane extending perpendicular to the first cross-sectional plane; wherein the spray cloud is formed in the combustion chamber with a clearance angle between the combustion-chamber top and the spray cloud, and wherein the clearance angle is uniform along the circumference of the spray cloud (see figures 1-3).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiraki et al. or Bailey.

With respect to claim 23, Hiraki et al. or Bailey teaches all the limitations of the claims except for the fuel injector has 20-40 spray discharge orifices. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to provide the device of Hiraki et al. or Bailey with the fuel injector has 20-40 spray discharge orifices, because Application has not disclosed that the fuel injector has 20-40 spray discharge orifices provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either claimed 20-40 spray discharge orifices or the Hiraki et al.'s number of orifices or Bailey's number of orifices. Therefore, it would have been an obvious matter of design choice to modify the device of Hiraki et al. or Bailey to obtain the invention as specified in claim 23.

Bailey teaches all the limitations of the claims except for the spread angle of approximate of 15 to 25 degrees. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to provide the device of Bailey with the spread angle of approximate of 15 to 25 degrees, because Application has not disclosed that the spread angle of approximate of 15 to 25 degrees provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either claimed spread angle of approximate of 15 to 25 degrees or the Bailey's spread angle. Therefore, it would have been an obvious matter of design choice to modify the device of Bailey to obtain the invention as specified in claim 24.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to show the art with respect to a fuel injection system: Cavanagh et al., and Sasaki et al.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dinh Q. Nguyen whose telephone number is 571-272-4907. The examiner can normally be reached on Monday-Thursday 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on 571-272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dinh Q Nguyen/
Primary Examiner, Art Unit 3752

dqn